4.4 HYDROLOGY, WATER RESOURCES, AND WATER QUALITY

This section addresses issues involving potential impacts on hydrology, water resources, and water quality resulting from the renewal of State Lease PRC-3904.1. The environmental setting provides information on existing water quality characteristics of the Santa Barbara Channel and onshore in the vicinity of the Ellwood Marine Terminal (EMT). The impacts evaluation focuses on the potential effects of the proposed Project and Alternatives, including cumulative impacts, on water quality in the area, and identifies potential mitigation measures.

4.4.1 Environmental Setting

This section characterizes the marine environment, including oceanographic processes and marine water quality, as well as onshore hydrology and water quality.

Regional Oceanographic Processes

The fate and effects of oil spills that could result from continuation of activities at the EMT are largely dictated by transport along the ocean surface since subsurface releases of petroleum hydrocarbons rapidly rise to the sea surface.

To improve modeling of oil-spill trajectories within the Santa Barbara Channel, Scripps Institution of Oceanography began a multi-year observational study in 1991 to characterize the general circulation within the Channel. Under the auspices of the Minerals Management Service (MMS), measurements included current-meter moorings, surface drifters, and hydrographic transects (Figure 4.4-1). Results have been summarized by Dever (1998), Harms and Winant (1998), Hendershott and Winant (1996), and Winant et al. (1999).

Many of these results are pertinent to the proposed Project. The EMT lies approximately 3 nautical miles (nm) (5.5 kilometers [km]) shoreward and slightly west of one of the long-term current-meter moorings, GOIN (Goleta Inshore). In addition, a National Oceanic and Atmospheric Administration (NOAA) Data Buoy Center (NDBC) site, designated NDBC53, is located approximately 10 nm (18.5 km) southeast of the EMT. It was fitted with an acoustic-Doppler current meter capable of continuously measuring a vertical profile of the flow field.

Figure 4.4-1
Location of Current-Meter Moorings, Buoys, and Hydrographic Stations near the EMT

Findings from the study indicate that processes operating on the open-ocean flow field at distant locations outside the Channel exert their influence locally through the major ocean currents that traverse the North Pacific Ocean. Beyond the Southern California Bight (>62 miles [100 km]), the diffuse southward-flowing California Current represents the eastern limb of the clockwise-flowing gyre that covers much of the North Pacific Basin. Before turning south to form the California Current, subarctic water is carried along at high latitudes and is exposed to precipitation, atmospheric cooling, and nutrient regeneration. As a result, waters of the California Current are characterized by a seasonably stable low salinity (32 to 34 parts per thousand), low temperature of approximately 55 to 68 degrees Fahrenheit (°F) (13 to 20 degrees Celsius [°C]), and high nutrient concentrations. They also undergo less seasonal variation than surface waters at similar latitudes along the eastern seaboard.

Immediately shoreward of the California Current, along the continental slope and shelf, is the northward flowing Davidson countercurrent that carries warm, saline, and less oxygenated waters up the coast from the Southern California Bight. These waters extend westward along the southern coastline of the Channel Islands and/or enter the Santa Barbara Channel at its eastern entrance, as shown in red in Figure 4.4-2. The Countercurrent typically is 6.2 to 12 miles (10 to 20 km) wide with velocities less than 1 foot per second (ft/s) or 30 centimeters/second (cm/s), but it is broader and stronger in the winter when it occasionally covers the continental shelf.

Figure 4.4-2
Sea Surface Temperatures within the Santa Barbara Channel

The warm waters of the Davidson countercurrent exhibit a strong seasonal variability in intensity that coincides with large-scale changes in coastal winds. Much of the year, an alongshore pressure gradient generally maintains a westward flow through the eastern Santa Barbara Channel entrance and along its northeastern reaches (MMS 2001). On average, winds blow from the northwest, parallel to the central California coast. The Davidson Current is strongest when these northwesterly winds relax between December and February. However, Figure 4.4-2 depicts the rapid spring transition back to strong northwesterly winds that occurs between March and June. This results in a brief reversal of flow within the Channel as surface water near the coast is transported offshore and downcoast and to be replaced by deep cool, nutrient-rich seawater in a process known as upwelling.

Currents in the Santa Barbara Channel arise from both this externally driven flow and a counterclockwise circulation restricted to the Channel's interior. Consequently, surface currents on the northern shelf near the EMT are predominantly westward throughout the year, with maximum flows during the summer and early fall. Monthly average flows reach 3 knots (kts or nautical miles per hour) (160 cm/sec) during most of the year. In contrast, average currents on the southern Channel shelf are eastward year-round and reach a maximum during the spring when the large-scale flow through the eastern Santa Barbara Channel entrance is eastward. These countercurrents on opposite sides of the eastern Channel form a counterclockwise cyclone throughout much of the year.

Superimposed on these average currents are six temporary flow patterns that prevail at various times (Figure 4.4-3). In all but one of these scenarios, Flood East (Figure 4.4-3(e)), the flow at the EMT is toward the west. The Flood East pattern occurs when the alongshore pressure gradient and the wind stress are acting to cause the flow everywhere in the Santa Barbara Channel to move toward the east. However, this flow regime does not last very long, is not particularly strong, and typically occurs in the winter.

At daily and shorter time scales, winds, tides, and waves also mix and transport ambient seawater near the sea surface. Although tidal currents can mix ocean waters, they are not responsible for significant net transport. The semidiurnal tidal oscillations enter through the eastern end of the Channel and propagate toward the west, driving currents of approximately 0.2 kts (10 cm/sec). Similarly, internal and surface gravity waves mix coastal seawater in both the horizontal and vertical directions, but do not account for significant net transport until they shoal upon shoreline approach.

Subsurface Flow

Subsurface currents are more important in determining the fate of oil and other contaminants released at or near the sea floor, prior to their reaching the sea surface. Long-term vertical profiles of currents in the eastern Santa Barbara Channel were recorded at NDBC53 (Figure 4.4-1). Average monthly current profiles are often strongly sheared and rotate in a counterclockwise direction with increasing depth. Nevertheless, near the EMT, subsurface flow remains strongly toward the west even when surface currents weaken during the spring. Average flow speed increases with depth throughout much of the year, except during late fall when westward surface flows intensify and become comparable to the subsurface speeds.

Figure 4.4-3
Schematic Diagrams of Six Synoptic Circulation Patterns in the Santa Barbara Channel

Waves

The surface wave climate is a mixture of remotely generated ocean swell and seas that are generated by local winds. The Santa Barbara Channel is comparatively sheltered from swell generated outside the Channel, and the limited fetch within the Channel impedes the local generation of seas with significant wave height. As a result, wave heights are low in the Channel, generally ranging from three to six feet (ft) (1 to 2 meters [m]) throughout most of the year. Thus, the prevailing sea state is unlikely to severely restrict oil-spill cleanup activities within the Channel, except in certain regions where a wave window could allow swell to enter the Channel.

Two primary meteorological sources generate significant swell energy that can enter the Channel: winter storms that impinge on the California coastline from the west and storm swell generated in the southern hemisphere during summer. Figure 4.4-4 shows wave-height distributions that resulted from two major swell events during 2002. A major North Pacific Storm at the beginning of the year generated swell that propagated into the Channel from the west, as shown in Figure 4.4-4(a). A tropical depression off the coast of Mexico generated the southerly swell event shown in Figure 4.4-4(b).

During winter storms, most locations along the northern coastline of the Santa Barbara Channel experience wave heights that are less than half as large as those that travel down the middle of the Channel. Certain coastal features, however, can locally amplify wave heights along this section of the coast, particularly near Ventura and at Rincon Point (Figure 4.4-4(a)). The focusing zone near Ventura is caused by the massive subaerial fan of sediment deposited on the shelf by the Ventura and Santa Clara Rivers. This large-scale bathymetric feature extends nearly 25 miles (40 km) offshore and concentrates much of the wave energy propagating eastward down the axis of the Channel onto a narrow stretch of coastline near the Santa Clara River mouth. Both of these focusing zones begin to influence wave height well offshore of the coastal feature (O'Reilly et al. 1999).

Figure 4.4-4(b) shows that swells generated during summer storms to the south are almost entirely obstructed by the Channel Islands. The locations of the narrow wave windows along the northern coast of the Santa Barbara Channel are extremely sensitive to the direction of the arriving swell, as shown by the fingers of light blue extending northward from the wave windows between Anacapa, Santa Cruz, and Santa Rosa Islands.

Waves impinge on the mainland shore of the Santa Barbara Channel at a slightly oblique angle, generally with a westerly component. This drives a long-shore current toward the east in the littoral (surf) zone (Emery 1960, cited in Hickey 1993). Thus, the net transport of particulates suspended in the water column near shore is toward the east, in opposition to the westward transport observed farther offshore. The beaches consist of fine- to medium-grained sands backed by high bluffs. About 75 percent of the sand transported to the east by the alongshore drift is discharged from rivers and streams, while the remainder is from cliff erosion. The net transport rate of sediment is approximately 8.1 million cubic feet (ft^3) (230,000 cubic meters [m^3]) per year (Chambers Group 1992).

Figure 4.4-4
Swell-Height Predictions in the Santa Barbara Channel during Large Events

Marine Water Quality

A number of factors, including oceanographic processes, contaminant discharge, erosion, and freshwater inflow affect the quality of marine water. Petroleum development activities, commercial and recreational vessels, natural hydrocarbon seeps, river runoff, municipal wastewater outfalls, and minor industrial outfalls all contribute to increased nutrients, trace metals, synthetic organic contaminants, and pathogens in offshore waters and sediments.

Marine water quality is largely determined by five seawater properties: temperature, salinity, turbidity, alkalinity, and dissolved oxygen. Long-term measurements of these parameters have been made as part of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) program (Scripps Institution of Oceanography [SIO] 2000). One regularly occupied station (42) is located approximately 37 nm (33 km) southwest of the EMT (see Figure 4.4-1 for its location). Figure 4.4-5 shows vertical profiles of ambient water-quality parameters measured at CalCOFI Station 42 during several cruises between 1999 and 2001.

The vertical density structure or stratification dictates the amount of vertical mixing within the water column (Fischer et al. 1979). Highly stratified waters inhibit vertical exchange of water, nutrients, and contaminants introduced by a point source, such as a produced-water discharge. Density stratification is largely determined by the temperature structure. Throughout most of the year, the water column is stratified with a surface mixed layer that extends slightly beyond the EMT mooring, at approximately 66 ft (20 m), overlying a thermocline that extends down to a depth of approximately 164 ft (50 m) (Figure 4.4-5(a)). Vertical differences in salinity shown in Figure 4.4-5(b) reflect the influence of deep saline waters brought into the Santa Barbara Channel from the south by the northward flowing undercurrent.

Within the surface mixed layer above the thermocline, dissolved oxygen levels are uniformly high and near saturation (Figure 4.4-5(c)). Rapid overturn within the mixed layer keeps surface waters near saturation due to rapid exchange with the overlying atmosphere. Correspondingly, nitrate and phosphate are depleted in the surface mixed layer due to uptake by primary production in the euphotic zone. Below the surface mixed layer, oxygen concentration steadily decreases with depth due to losses from biotic respiration and decomposition.

Figure 4.4-5
Vertical Profiles of (a) Temperature, (b) Salinity, (c) Dissolved Oxygen, and (d) Light Penetration Recorded at CalCOFI Station 42

Figure 4.4-5(d) shows that the majority of light penetration occurs within the euphotic zone, which reaches to approximately 66 ft (20 m). Light penetration is largely determined by the concentration of suspended particulate matter near the sea surface. Turbidity decreases the clarity of seawater within the euphotic zone.

The euphotic zone is restricted to depths where ambient light intensity exceeds roughly one percent of surface illumination, which is the minimum necessary for phytoplankton growth. Turbidity is increased in coastal waters as a result of phytoplankton blooms, storm runoff, sediment re-suspension, and discharge of wastewater. Substantial sediment input from onshore occurs in the form of large isolated pulses rather than a steady discharge of material. Between November and April, intense storm events occasionally punctuate the prevailing semi-arid climate and result in mass runoff with profound increases in coastal turbidity (Hickey 1999).

Trace Metals

Ambient trace metal concentrations in the water column are generally below the detection limit of standard analytical methods. Because these and other contaminants are difficult or impossible to measure directly in seawater, resident California mussels (*Mytilus californianus*) have been used as sentinel organisms to indirectly monitor water quality. Like most filter feeders, mussels are capable of concentrating contaminants by factors of 10^2 to 10^5 in their tissues. Bivalves accumulate contaminants directly from seawater and from ingested food. They also provide a time-integrated measure of the concentration of bioavailable contaminants in the water column.

Average trace-metal concentrations in coastal waters of the Santa Barbara Channel are generally lower than in the embayments and harbors that feed into the Channel, and they are lower than the elevated concentrations found in some of the more contaminated locations along the California coast. This is evident from the trace metal data from the State Mussel Watch Program that are summarized in Figure 4.4-6 (SWRCB 2000). The bar chart shows average concentrations from 26 samples collected at various sites along the open Santa Barbara Channel, including sites on the Channel Islands. The other bar displays the average concentrations from the 26 samples collected at sites within embayments and harbors, such as Santa Barbara and Ventura Harbors. The embayment concentrations are higher for all but two metals.

Figure 4.4-6
Average Trace-Metal Concentrations in Mussels Collected Along the Open Coast and Within Embayments of the Santa Barbara Channel Compared to Statewide Levels

The higher embayment concentrations are expected because dispersion is more limited in the embayments and some of the harbors have haul-out facilities where vessels are regularly cleaned, painted, and repaired. For comparison, the 95 percent Elevated Data Level (EDL) is also shown for each metal. It reflects the concentration above which five percent of the 400 samples collected State-wide were distributed. Average concentrations along the open coastline of the Santa Barbara Channel were well below the top five percent of samples collected State-wide. Thus, the concentrations of these nine trace metals were frequently higher in bivalves found in other more-contaminated California coastal regions, especially those collected near more urbanized areas.

Waterborne Bacteria and Microorganisms

Bacteria levels in the Santa Barbara Channel vary widely and often increase after significant rainfall. This increase is due to the runoff of contaminants accumulated onshore. How bacterial pathogens survive after their introduction into the marine environment is currently the subject of investigation. Some studies have indicated that bacteria in seawater can remain infectious but undetectable by standard techniques used for microbiological monitoring (Grimes et al. 1986). Standard techniques report the most probable number (MPN) of coliform organisms per ounce (oz) (per 100 milliliters [ml]) of water sample (MPN/oz [MPN/100ml]) and have detection limits near 0.6 MPN/oz (2 MPN/100ml). The California Ocean Plan's bacterial limits for water contact areas are 294 total coliform organisms per oz (1,000 total coliform organisms per 100ml) and 59 MPN/oz (200 MPN/100ml) for fecal coliform. While coliform densities in the water column are typically near the detection limit, surfzone samples adjacent to creeks and rivers often exceed bacterial standards during periods of high runoff (MRS 2004).

Bacterial contamination in treated effluent discharged from wastewater point sources in the region is low and has little tangible effect on marine water quality. The cities of Goleta, Santa Barbara, Montecito, Summerland, Carpinteria, and Oxnard all discharge treated sewage to the Channel, totaling approximately 36 million gallons per day (MGD) (136,275 m^3 per day). These effluents contain approximately 20 parts per million (ppm) (20 milligrams per liter [mg/L]) of suspended solids and 60 ppm (60 mg/L) of biochemical oxygen demanding material.

Excess nutrients in near-surface waters can lead to blooms of toxin-producing dinoflagellates in the form of red tides that result in deleterious impacts on water quality. Phytoplankton productivity is normally limited by the availability of the micronutrient nitrates, phosphates, and silicates in the upper water column. Upwelling is an important mechanism for adding nutrients to the euphotic zone. Nutrients are also added to coastal waters by wave-induced re-suspension of organic material contained within seafloor sediments. Onshore runoff and sewage discharge can also introduce unhealthy amounts of nitrogen, which is usually the limiting nutrient for primary production.

Petroleum Hydrocarbons

Petroleum hydrocarbons are an organic contaminant that can be of anthropogenic or natural origin. The principal sources of petroleum hydrocarbons in the Santa Barbara Channel include:

- Urban runoff of road material, auto exhaust, lubricating oils, gasoline, diesel fuel, and tire particles;
- Produced water discharges;
- Atmospheric deposition from the combustion of fossil fuels;
- Vessel leaks, spills, and exhaust;
- Leaching of creosote from wooden pilings;
- Oil and grease contained in municipal sewage effluent; and
- Natural oil seeps.

Natural seeps along the coasts of Santa Barbara and Ventura Counties discharge significant quantities of oil and tar to the nearshore waters of the Channel. Fisher (1978) found that as few as 2,000 and as much as 30,000 metric tons (240,000 barrels [bbls]) of oil enter the Santa Barbara Channel each year from natural seeps. The intertidal zone at Goleta, including the shoreline adjacent to the EMT, is chronically contaminated with naturally occurring oil and tar from the Coal Oil Point Seep. Another major seepage zone exists to the east, in the Santa Barbara/Rincon area. A detailed discussion of oil seeps is found in Section 4.1, Geological Resources.

Generally, marine oil spills do not severely degrade open-ocean water quality except during, and for a few weeks after, the spill. Most of the components of crude oil are insoluble in seawater and, because the spill floats on the sea surface, impacts to the water column are limited. Also, aromatic hydrocarbons, such as benzene and toluene, which are considered to be the most toxic to marine life, evaporate quickly as the spill weathers in the marine environment. Other weathering processes, such as spreading, dissolution, dispersion, emulsification, photochemical oxidation, and microbial degradation, decrease the volume of the oil slick and increase the viscosity and specific gravity of the spilled oil. Thus, mortality of marine organisms arising from the physical effects of smothering and coating is of greatest concern from weathered oil. However, toxicological effects from exposure to aromatic hydrocarbons can be significant if unweathered oil reaches the shoreline, particularly in areas with rocky shorelines, enclosed embayments, estuaries, and wetlands. As discussed in Section 4.5, Biological Resources, the coastline of the Santa Barbara Channel includes many of these sensitive coastal habitats.

Onshore Water Resources

Topography and Drainage

The EMT is situated on a coastal marine terrace, approximately 500 feet (150 m) northeast of a coastal bluff; approximately 800 feet (244 m) northeast of the Pacific Ocean; approximately 1,000 feet (300 m) northwest of Devereux Slough; and approximately 1,500 feet (450 m) southwest of Devereux Creek (see Figure 4.4-7). The topography at the site has been partially graded, resulting in relatively flat-lying areas on which the storage tanks, pump house, control room, and related infrastructure are located. However, a southeast-trending gully, approximately 20 to 25 feet (6 to 7.5 m) deep, is located along the southwest portion of the site. An earthen-fill dam has been constructed across the upper portion of the gully, creating a pond upstream of the dam. The gully trends toward a dune swale pond and surrounding wetland, located approximately 400 to 500 feet (120 to 150 m) southeast and topographically downgradient from the EMT and associated marine loading line, at the closest point. The pond and surrounding wetland is an enclosed drainage that is not hydrologically connected, i.e., on the surface, to nearby Devereux Slough, except when water level in the Slough is greater than 5.6 feet (2 m) above mean sea level (Santa Barbara County 2004; UCSB 2004). During such periods of higher water levels, a small southeast trending drainage located along the landward side of the coastal dunes connects the two water features, thus substantially increasing the storage capacity of the Slough.

Figure 4.4-7
Topography and Drainage

From the EMT, the onshore portion of the marine loading line trends southwest across the southeast-trending gully and southeast-sloping coastal marine terrace; across active coastal sand dunes blanketing the approximate 20 foot (6 m) high coastal bluff; and across a relatively flat beach area. With the exception of the gully, surface runoff occurs as sheetflow within the EMT and across the coastal terrace on which the marine loading line is situated. Sheetflow runoff from the EMT generally flows northeast and southeast toward Devereux Creek and Devereux Slough, whereas runoff from the pipeline corridor occurs as sheetflow and gully flow southeast toward the nearby dune swale pond/wetland area, as well as southwest toward the Pacific Ocean.

Devereux Creek Watershed

Devereux Creek is a mapped blue line creek and designated environmentally sensitive wetland habitat (Santa Barbara County 2000). The creek flows only intermittently with its mapped source located in the area now known as Winchester Commons, located approximately 1.5 miles (2.4 km) northwest of the project site. The Devereux Creek watershed is approximately 2,369 acres (959 hectares [ha]) and is bounded by the foothills of the Santa Ynez Mountains to the north, Storke Road and Isla Vista to the east, the Pacific Ocean to the south, and Ellwood Canyon to the west. The watershed includes two north-south trending, unnamed feeder creeks, which flow into Devereux Creek on the Ellwood Mesa, north-south trending Phelps Ditch/El Encanto Creek, and other man-made drainage channels (Figure 4.4-8). Watershed elevations range from sea level to 580 feet (177 m) above mean sea level. Lower areas of the watershed generally are urbanized and the upper reaches consist primarily of native coastal sage scrub and chaparral vegetation, as well as agricultural lands. Approximately 60 percent of the watershed has been developed. Although rainfall averages approximately 15.5 inches (39 centimeters [cm]) near Devereux Slough, the basin-wide average is nearly 18 inches (46 cm). Natural annual runoff was approximately 480 acre-feet (592,071 m^3) in 1944; however, the volume has increased approximately 44 percent with urban development and now exceeds 690 acre-feet (851,102 m^3) per year (Davis et al. 1990). Although sometimes dry, the segment of Devereux Creek occurring northeast of the project site is nevertheless an integral element of the Devereux Slough Ecological System, providing fresh water to the estuarine system.

Since the late 1920s, coastal development and industrialization has led to significant decline in general ecosystem health. Federal, State, and local policies to drain, fill, or somehow convert wetlands to more “productive” agricultural and urban land uses were the norm, resulting in widespread direct destruction of wetland habitat. Substantial ecological impacts to wetlands continue from historical filling, hydrologic modification, including flood control and water supply projects, pollution from point and nonpoint sources, and introduction of invasive species (California Coastal Conservancy 2001).

Figure 4.4-8
Watershed Map

Water quality testing included as part of the Santa Barbara County Water Agency's Project Clean Water indicates that the Devereux Slough is polluted by runoff containing bacteria and nutrients that exceed acceptable levels, which are capable of accelerating aquatic plant and algae growth. In particular, 1999/2000 storm water testing indicates that water in Devereux Creek has elevated levels of fecal and total coliform, enterococcus, pesticides (primarily diazinon), and heavy metals such as copper, lead, and zinc. In addition, streams entering Devereux Slough carry a high sediment load. These pollutants and others typical of urban development are apparently contributing to significant degradation of the Devereux Slough sensitive habitat (Santa Barbara County 2001; Almy 2001).

Groundwater

The project site overlies the West Subbasin of the Goleta Groundwater Basin. This underground reservoir is considered to be hydrologically separate from the North and Central subbasins of the Goleta Groundwater Basin (Goleta North/Central Basin). Based on the most recent analysis, the West Subbasin is in a state of surplus. However, water quality from wells drilled in this subbasin is of poor quality and low yield. Saline, perched groundwater may be present beneath portions of the project site, at depths equal to or slightly above sea level, as evidenced by a dune swale pond, located southeast of the project area. Because the topography beneath the project site varies from sea level to approximately 60 feet (18 m) above mean sea level, groundwater may be present at depths varying from a few feet (1 m) to approximately 60 feet (18 m) below ground surface.

4.4.2 Regulatory Setting

Federal

Clean Water Act (33 U.S.C. ss/1251 et seq.)

The 1972 Federal Water Pollution Control Act and its 1977 amendments, collectively known as the Clean Water Act (Act), established national water-quality goals and the basic structure for regulating discharges of pollutants into the waters of the United States. The Act also created a National Pollutant Discharge Elimination System (NPDES) of permits that specified minimum standards for the quality of discharged waters. It required states to establish standards specific to water bodies and designated the types of pollutants to be regulated, including total suspended solids and oil. The Act authorized the U.S. Environmental Protection Agency (EPA) to issue the NPDES permits.

Under NPDES, all point sources that discharge directly into waterways are required to obtain a permit regulating their discharge. Each NPDES permit specifies effluent limitations for particular pollutants as well as monitoring and reporting requirements for the proposed discharge. Permit issuance, receipt of monitoring data submitted by permittees, compliance monitoring, and enforcement are the primary responsibilities of states when the discharge occurs within the 3-mile (4.8 km) territorial limit.

Oil Pollution Act

The Oil Pollution Act of 1990 established a single uniform Federal system of liability and compensation for damages caused by oil spills in U.S. navigable waters. The Act requires removal of spilled oil and establishes a national system of planning for and responding to oil spill incidents. It includes provisions to:

- Improve oil-spill prevention, preparedness, and response capability;
- Establish limitations on liabilities for damages resulting from oil pollution;
- Provide funding for natural resource damage assessments;
- Implement a fund for the payment of compensation for such damages; and
- Establish an oil pollution research and development program.

The Secretary of Interior is responsible for spill prevention, oil-spill contingency plans, oil-spill containment and clean-up equipment, financial responsibility certification, and civil penalties for offshore facilities and associated pipelines in all Federal and State Waters. The U.S. Department of Transportation (U.S. Coast Guard [USCG]) was designated as the lead agency for offshore oil spill response, which includes responsibility for coordination of Federal responses to marine emergencies. The USCG is also responsible for enforcing vessel compliance with the Act.

Marine Plastic Pollution Research and Control Act

Originally enacted as the Act to Prevent Pollution from Ships, it prohibited any discharge of oil from a ship within 12 nm (22 km) of land, unless it did not exceed 15 ppm (15 mg/L) or the ship had oil-water separating equipment. The Act was amended in 1987 to implement Annex V of the International Convention of the Prevention of Pollution from Ships. As such, it prohibits the discharge of plastic, garbage, and floating dunnage within three nm (6 km) of land. Beyond three nm (6 km), garbage must be ground to less than one inch (2.5 cm), but discharge of plastic and floating dunnage is still restricted. This Act requires manned offshore platforms, drilling rigs, and support vessels operating under a Federal oil and gas lease to develop waste management plans and to post placards reflecting discharge limitations and restrictions on plastics and other forms of solid wastes. The USCG enforces these requirements.

Coastal Zone Management Act

In accordance with the Coastal Zone Management Act and the Coastal Zone Reauthorization Amendments of 1990, all federal activities must be consistent, to the maximum extent practicable, with the enforceable policies of each affected state's coastal zone management program. Each state's Coastal Zone Management program sets forth objectives, policies, and standards regarding public and private use of land and water resources in the coastal zone.

Marine Protection, Research, and Sanctuary Act

In 1972, this Act established the National Marine Sanctuary Program, which is administered by the NOAA of the Department of Commerce.

There are two Federal marine sanctuaries within the project study area: Channel Islands National Marine Sanctuary (CINMS) and Monterey Bay National Marine Sanctuary (MBNMS). The primary goal of these sanctuaries is the protection of the natural and cultural resources contained within their boundaries.

Designated in 1980, the CINMS surrounds the four northern Channel Islands out to a distance of six nm (11 km). Sanctuary regulations prohibit exploring for, developing, and producing hydrocarbons within the CINMS, except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline, provided specified oil spill contingency equipment is available at the site of such operations. In 2003, regulations went into effect that restrict fishing and other extractive uses in 10 marine reserves and two conservation areas within the CINMS (CDFG 2001, CINMS 2001, and CDFG 2002).

The MBNMS, created in 1992, is located offshore of California's central coast. Stretching from Marin to Cambria, the MBNMS encompasses a shoreline length of 276 miles (444 km) and 5,322 square miles (13,784 km^2) of ocean, extending an average distance of 30 miles (48 km) from shore. As such, the northern barge transport route passes through portions of the MBNMS en route to San Francisco. Within the boundaries of the sanctuary are the nation's largest kelp forests, one of North America's largest underwater canyons, and the closest-to-shore deep ocean environment in the continental United States. The MBNMS is also home to one of the most diverse marine ecosystems in the world, including 33 species of marine mammals, 94 species of seabirds, 345 species of fishes, and numerous invertebrates and plants.

USCG Regulatory Authority

Primary responsibility for the enforcement of U.S. maritime laws and regulations falls upon the USCG The USCG is responsible for managing and regulating provisions for safe navigation of vessels in U.S. waters, as well as the enforcement of environmental and pollution prevention regulations. As such, the USCG provides for the regulation and enforcement of hazardous working conditions on the outer continental shelf (OCS), for the management and regulations of measures for pollution prevention in territorial waters, and for ensuring the implementation of provisions in the Oil Pollution Act and the Marine Plastic Pollution Research and Control Act. The USCG also enforces the Clean Water Act, including approval of procedures to be followed and the equipment used for the transfer of oil from vessel to vessel and between onshore and offshore facilities and vessels. The USCG also conducts pollution surveillance patrols to detect oil discharges within the territorial sea and contiguous zone and has enforcement authority over violations. The USCG maintains strike team responsibilities should an oil spill occur.

State

California Water Code

Section 13142.5 of the California Water Code provides marine water-quality policies stating that wastewater discharges shall be treated to protect present and future beneficial uses, and, where feasible, to restore past beneficial uses of the receiving waters. The highest priority is given to improving or eliminating discharges that adversely affect wetlands, estuaries, and other biologically sensitive sites; areas important for water contact sports; areas that produce shellfish for human consumption; and ocean areas subject to massive waste discharge.

Porter-Cologne Water Quality Control Act (CWC section 13000 et seq.; CCR Title 23, Chapter 3, Chapter 15)

Since 1973, the California State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs) have been delegated the responsibility for administering permitted discharge into the coastal marine waters of California. The Porter-Cologne Water Quality Act provided a comprehensive water-quality management system for the protection of California waters and regulated the discharge of oil into navigable waters by imposing civil penalties and damages for negligent or intentional oil spills. Under the Act "any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state" must file a report of the discharge with the appropriate Regional Water Quality Control Board. Pursuant to the Act, the regional board may then prescribe "waste discharge requirements" (WDRs) that add conditions related to control of the discharge. Porter-Cologne defines "waste" broadly, and the term has been applied to a diverse array of materials, including non-point source pollution. When regulating discharges that are included in the Federal Clean Water Act, the State essentially treats WDRs and NPDES as a single permitting vehicle. In April 1991, the SWRCB and other State environmental agencies were incorporated into the California Environmental Protection Agency.

This Act is the primary State regulation addressing water quality and waste discharges on land. Permitted discharges must be in compliance with the regional Basin Plan that was developed by the Central Coast Regional Water Quality Control Board for Region 3, which includes Santa Barbara County and the EMT area. Each Regional Board implements the Basin Plan to ensure that projects consider regional beneficial uses, water quality objectives, and water quality problems.

The Project does not involve any discharges to surface waters and, therefore, does not likely require section 401 certification. However, the RWQCB regulates urban runoff discharges under the National Pollutant Discharge Elimination System (NPDES) permit regulations. NPDES permitting requirements cover runoff discharged from point, e.g., industrial outfall discharges, and nonpoint, e.g., stormwater runoff, sources. The RWQCB implements the NPDES program by issuing construction and industrial discharge permits.

Best Management Practices (BMPs) are required as part of a Storm Water Pollution Prevention Plan (SWPPP). The EPA defines BMPs as "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the United States. BMPs include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage" (40 CFR 122.2).

The EMT is not covered by an existing industrial SWPPP.

California Harbors and Navigation Code

Discharges from vessels within territorial waters are regulated by the California Harbors and Navigation Code. One of its purposes is to prevent vessel discharges from adversely affecting the marine environment. Section 151 regulates oil discharges and imposes civil penalties and liability for cleanup costs when oil is intentionally or negligently deposited on the waters of the State of California.

California Ocean Plan

The SWRCB prepares and adopts the California Ocean Plan, which incorporates the State water quality standards that apply to all NPDES discharge permits (Table 4.4-1) and which is part of the California Coastal Management Program. The standards identified in the California Ocean Plan are consistent with the limitations specified in the NPDES General Permit. This determination was made when the CCC (2001) concurred with the EPA's consistency certification that the proposed activities are consistent with the enforceable policies of the Coastal Management Program. In addition to the narrative standards specified in the Ocean Plan, numerical water quality objectives are specified.

Proposed California Toxics Rule

Water quality criteria for priority toxic pollutants for California inland surface waters, enclosed bays, and estuaries have been proposed. These federally promulgated criteria, when finalized, together with State-adopted designated uses, will create water quality standards for California inland waters. This rule will satisfy Clean Water Act requirements and fill the need for water quality standards for priority toxic pollutants to protect public health and the environment. U.S. EPA and the State of California are working to restore standards to California waters; therefore, the EPA is now proposing water quality criteria and the State will soon be proposing implementation procedures to ensure that the resulting water quality standards will be appropriately and consistently applied throughout the State.

Table 4.4-1
California Ocean Plan Water Quality Standards

A. Bacterial Characteristics

1. Water-Contact Standards

Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline and in areas outside this zone used for water contact sports, as determined by the Regional Board, but including all kelp beds, the following bacterial objectives shall be maintained throughout the water column:

a. Samples of water from each sampling station shall have a density of total coliform organisms less than 1,000 per 100 ml (10 per ml), provided that not more than 20% of the samples at any sampling station, in any 30-day period, may exceed 1,000 per 100 ml (10 ml) and provided further that no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 per 100 ml (100 ml).
b. The fecal coliform density based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200 per 100 ml nor shall more than 10% of the total samples during any 60-day period exceed 400 per ml.

The "Initial Dilution Zone" of wastewater outfalls shall be excluded from designation as "kelp beds" for purposes of bacterial standards, and Regional Boards should recommend extension of such exclusion zone where warranted to the State Board. Adventitious assemblages of kelp plants on waste discharge structures, e.g., outfall pipes and diffusers, do not constitute kelp beds for purposes of bacterial standards.

2. Shellfish Harvesting Standards

At all areas where shellfish may be harvested for human consumption, as determined by the Regional Board, the following bacterial objectives shall be maintained throughout the water column:
The median total coliform density shall not exceed 70 per 100 ml and not more than 10% of the samples shall exceed 230 per 100 ml.

B. Physical Characteristics

1. Floating particulates and grease and oil shall not be visible.
2. The discharge of the waste shall not cause aesthetically undesirable discoloration of the ocean surface.
3. Natural light shall not be significantly reduced at any point outside the initial dilution zone as a result of the discharge of waste.
4. The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded.

C. Chemical Characteristics

1. The dissolved oxygen concentration shall not at any time be depressed more than 10% from which occurs naturally, as a result of the discharge of oxygen demanding waste materials.
2. The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.
3. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions.
4. The concentration of substances set forth in Chapter IV, Table B in marine sediments shall not be increased to levels which would degrade indigenous biota.
5. The concentration of organic materials in marine sediments shall not be increased to levels which would degrade marine life.
6. Nutrient materials shall not cause objectionable aquatic growths or degrade indigenous biota.

D. Biological Characteristics

1. Marine communities, including vertebrate, invertebrate and plant species, shall not be degraded.
2. The natural taste, odor and color of fish, shellfish, or other marine resources used for human consumption shall not be altered.
3. The concentration of organic materials in fish, shellfish or other marine resources used for human consumption shall not be bioaccumulated to levels that are harmful to human health.

E. Radioactivity

1. Discharge of radioactive waste shall not degrade marine life.

California Coastal Act (PRC 30000 et seq.)

The California Coastal Act is the principal planning and regulatory program for the coastal zone of California. It governs a variety of actions and activities that affect the shoreline throughout the State. Specifically, the Act protects coastal access, environmentally sensitive habitats, agricultural lands, fisheries, cultural resources, and scenic qualities of the shoreline. The Act also establishes guidelines for development in the coastal zone and contains provisions for protecting life and property from coastal hazards. It is implemented through Local Coastal Programs that are developed and adopted by county and city jurisdictions as well as other State agencies that own land in the coastal zone. The Act also addresses surface waters. Specific sections of the Act, address flood hazards and disturbances, maintenance of biological productivity in surface waters, and potential impacts from runoff.

Local

Water Quality Control Plan

The State Water Resources Control Board allocates water rights, adjudicates water right disputes, develops State-wide water protection plans, establishes water quality standards, and guides the nine Regional Water Quality Control Boards located in the major watersheds of the State. The Regional Boards serve as the frontline for State and Federal water pollution control efforts. The proposed Project falls under the jurisdiction of the Central Coast RWQCB, which has established a Water Quality Control Plan (Basin Plan) for the coastal watersheds of San Luis Obispo, Santa Barbara, and Monterey Counties (RWQCB 1994). The standards of the RWQCB incorporate the applicable portions of the Ocean Plan and are more specific to the beneficial uses of marine waters adjacent to the project site. These water quality objectives are designed to protect the beneficial uses of ocean waters within specific drainage basins. The EMT Facility lies within Santa Barbara County, while the barge route to Long Beach passes offshore of Los Angeles and Ventura counties. The barge route to San Francisco passes offshore of several additional counties (San Luis Obispo, Monterey, Santa Cruz, San Mateo, and San Francisco Counties), as well as through portions of the Monterey Bay National Marine Sanctuary.

Project Clean Water

The Santa Barbara County Water Agency, Project Clean Water has been established to reduce or eliminate discharges of pollution into creeks, rivers, ponds, or ocean waters, through implementation of NPDES permit requirements and applicable regulations. This agency completes stormwater sampling at select locations, including Devereux Slough, located adjacent to the project site. The County Water Agency is currently in the process of adopting provisions of the Storm Water Phase II Final Rule, which requires the operator of a regulated small municipal separate storm sewer system (MS4) to obtain NPDES permit coverage because discharges of storm water from such systems are considered point sources of potential pollution. MS4s are considered publicly owned or operated point sources because they collect storm water and direct it to discrete conveyances, including roads with drainage systems and municipal streets.

4.4.3 Significance Criteria

This section describes criteria for evaluating the significance of project-related activities or incidents that may result in impacts to water quality resources. In general, the persistence, extent, and amplitude of a marine impact dictate its significance. Although the thresholds of significance for water-quality impacts are based on quantitative limits promulgated in existing standards, guidelines, and permits, interpretation of unacceptable changes in seawater or sediment conditions often requires some judgment. For example, standards contained in a particular permit may be outdated, or the discharge may be causing previously unrecognized water-quality impacts. In other instances, perceived impacts may be a statistical artifact, such as the toxic sediment guideline for nickel, which exceeds background concentrations in the Santa Barbara Channel.

Impacts to water quality would be considered significant if:

- Contaminant concentrations within the CINMS, MBNMS or within Santa Barbara Channel coastal wetlands measurably increase relative to background concentrations (this criteria addresses water-quality impacts that impinge on marine sanctuaries or sensitive habitats). Potential project-related changes in seawater properties would be measured against the naturally occurring variability in those properties within the Santa Barbara Channel;

- The water quality objectives contained in the Water Quality Control Plan for the Central Coast are exceeded;

- The water quality objectives in the California Ocean Plan (SWRCB 2001) are exceeded;

- The water quality criteria in the Proposed California Toxics Rule are exceeded;
- Project operations that change background levels of chemical and physical constituents or elevate turbidity producing long-term changes in the receiving environment of the site, area, or region thereby impairing the beneficial uses of the receiving water occur; or
- Contaminant levels in the water column are increased to levels shown to have the potential to cause harm to marine organisms even if the levels do not exceed formal objectives in the Water Quality Control Plan.

4.4.4 Impact Analysis And Mitigation

The proposed Project would increase the likelihood of an accidental release of crude oil to the marine environment. Analyses of risk presented in Section 4.2, Hazards and Hazardous Materials, indicate the possibility of a release of crude oil into the marine environment. Also, increased production above current levels would increase the frequency, though not the volume, of potential crude oil spills due to an increase in barge trips and in the annual operating hours of the loading pipeline (see Section 4.2, Hazards and Hazardous Materials).

Impact WQ-1: Oil Spill Impacts to Marine Water Quality

Accidental discharge of petroleum hydrocarbons into marine waters would adversely affect marine water quality (Significant, Class I).

Impact Discussion

At the proposed permitted operation capacity of the EMT, barge trips would increase to approximately 88 per year. As the storage at the EMT would not change, the capacity of the loading line and equipment and the loading pipeline transfer rates would remain the same, the size of spills would be the same for the proposed Project as for the current operations. Finally, the frequency and duration of trips made by offshore support vessels and the barge Jovalan would increase under the proposed Project. The increased vessel traffic would increase the risk of a vessel accident and an attendant spill.

The proposed Project would increase the risk of an oil spill beyond current baseline conditions. A large spill would meet all of the threshold criteria for a significant water-quality impact. Namely, it would introduce hydrocarbon contaminants that were persistent, would extend well beyond the project area, would impact the marine ecosystem, and would measurably depart from background concentrations. Therefore, impacts to marine water quality from a large crude oil spill (for the definition of a large spill see Section 4.2, Hazards and Hazardous Materials, Risk Assessment Methodology subsection) would be considered potentially significant.

Spilled oil produces several impacts to marine water quality that are explicitly addressed in the California Ocean Plan (Table 4.4-1). Surface slicks limit equilibrium exchange of gases at the ocean-atmosphere interface. This reduces near-surface oxygen concentrations, particularly with the increased biochemical oxygen demand of crude-oil emulsions. As the seawater-oil emulsion mixes into the water column, turbidity would increase and toxic hydrocarbons would be released into the water column and seafloor sediments. Weathering can widely disperse tar balls, which may eventually be ingested by pelagic and benthic biota, with adverse effects. Although a surface slick can disperse within a few hours of a spill in harsh sea states, lingering effects could persist for much longer periods. For example, it took approximately two years for mussel tissue burdens of aromatic hydrocarbons to return to background levels after the Exxon Valdez Oil Spill (Boehm et al. 1995). Although this spill was several magnitudes larger than that estimated for the proposed Project, monitoring results indicate the potential for long-term effects. Because there is an increased likelihood of a large oil spill as a result of the proposed Project, and because such a spill would result in tangible damage to marine water quality in excess of levels identified in regulatory criteria, accidental discharges of petroleum hydrocarbons into marine waters are considered a significant impact.

An oil spill trajectory analysis for the EMT is discussed in Section 4.2, Hazards and Hazardous Materials. Ocean impact areas were found to be similar for spills from the barge Jovalan and from the oil loading pipeline. Spills from the terminal facilities could impact the coast and beaches, depending on conditions, as far north as Point Purisima and as far south as the Channel Islands and Point Dume. The highest probability of impact from a spill at the terminal is the coastline adjacent to the terminal operations. Depending on the meteorological conditions, the MMS GNOME model (Appendix C) estimates that up to 69 percent of spilled oil would end up on the beaches.

Spills could potentially extend substantial distances and impact ocean areas south of the Channel Islands, impacting the CINMS. However, uncertainty about the influence of wind drift on spilled oil, limitations in the model, and the prevailing northward surface current flow suggest that oil spilled within the project area could also impact coastlines to the north. Additionally, spills occurring during transit along the barge routes could potentially affect marine water quality and sensitive marine habitats within the CINMS, MBNMS, and GFNMS.

Mitigation Measures

Implement **MM HM-1b** through **HM-9a** identified in Section 4.2, Hazards and Hazardous Materials.

Rationale for Mitigation

Implementation of these mitigation measures would reduce the probability of an oil spill and the subsequent consequences to the marine environment. The identified measures would eliminate oil in the submarine loading pipeline when the line is not being used for oil transfer; the measures would enhance planning and preparedness to respond to the oil spill, and therefore, these measures would reduce both the potential oil spill size and the potential for oil spills. The measures would also increase the effectiveness of an oil spill cleanup effort...

Residual Impacts

Marine water quality impacts associated with accidental oil spills are categorized as significant (Class I) because the proposed mitigation measures would not be completely effective in reducing the significant risk of a spill, nor would they adequately eliminate the significant effect of a spill on marine resources. A large spill (see definition in Section 4.2, Hazards and Hazardous Materials) would violate many of the water quality standards and have a deleterious effect on the marine environment and biota. It would generate visible surface sheens, significantly reduce the penetration of natural light, reduce dissolved oxygen, degrade indigenous biota, and result in hydrocarbon contamination within the water column and marine sediments. The duration and area of the impact would be largely dictated by the size and location of the spill, and the various physical conditions of the sea at the time of the spill. Impacts would last from days to weeks and extend for tens of kilometers.

Mitigation of water quality impacts from a major marine oil spill is largely a function of the efficacy of the spill response measures. The effectiveness of spill cleanup measures is dependent on the response time, availability and type of equipment, size of the spill, and the weather and sea state during the spill. Only some of these aspects are within the control of the spill response team. In addition, many oil spill response measures, such as dispersants, have impacts of their own.

Under the regulatory-based significance criteria described in Section 4.4.3, even small oil spills could be considered potentially significant. Many regulations and guidelines establish limits based on the presence of a visible sheen on the ocean surface. This criterion is reflected in the static sheen test for free oil identified in the NPDES General Permit, USCG regulations, and the aesthetic criterion C.1 in the Ocean Plan Standards (see Table 4.4-1). Adverse aesthetic impacts from a visible sheen would occur upon discharge of a very small amount of free-phase hydrocarbons into calm marine waters. Because sheens are so thin, as little as 0.5 ounce (28 grams) of oil can form a rainbow sheen covering 500 ft^2 (46 m^2) of calm ocean surface area (Taft et al. 1995).

Although the technology has improved in recent years, complete containment and cleanup of an oil spill at sea is nearly impossible. The effectiveness of offshore containment and cleanup equipment and procedures is largely dependent on the type of oil, volume, sea state, e.g., swells, wind waves, chop, etc., and proper use of the equipment. Shoreline contamination is probable with any major spill in the area under adverse sea and weather conditions that exceed the capabilities of the containment and cleanup equipment. In the case of the Torch pipeline spill that occurred in 1997, shoreline contamination occurred even under best case weather and sea conditions for offshore containment and cleanup (Santa Barbara County 2001).

With respect to wind-wave conditions, the containment effectiveness of booms begins to lessen at a significant wave height of two feet (0.6 m). Above two feet (0.6 m), booms and skimmers are ineffective; however, it is likely that a slick would be dispersed and mixed into the water column. For long-period swell conditions, booms and skimmers can retain effectiveness in wave heights greater than two feet (0.6 m). High winds can cause some type of booms to lie over, allowing oil to splash and flow over the boom. High winds can also affect the deployment or shape of the deployment and, thus, the containment effectiveness of the boom.

Because there are limitations to thorough containment and cleanup of an offshore oil spill, potentially significant impacts (Class I) to water quality remain.

Impact WQ-2: Potential Facilities Leaks and Impacts to Nearby Onshore Waterways

A rupture or leak from the marine loading line, oil storage tanks, or other EMT infrastructure could substantially degrade surface and groundwater quality (Significant, Class I).

Impact Discussion

No new grading, excavations, or construction would occur in association with the proposed Project. However, lease renewal would extend the risk of potential failure of the marine loading line, oil storage tanks, and other infrastructure. A spill could substantially degrade groundwater and surface water in a nearby dune swale pond, a surrounding wetland area, and Devereux Slough. Because the potential for spills already exists within the project area, the possible presence of a spill to onshore water resources associated with the proposed Project is related to the incremental change in the size of the spill event. Small leaks or spills, which are contained and remediated quickly, may have minor or negligible impacts to onshore water resources. In contrast, large spills, or pipeline or tank ruptures, which spread to surface waters and/or groundwater, may substantially degrade water quality, with potential long-term impacts to beneficial uses and biological resources. The proposed Project increases the lifetime probability of leaks or spills. Therefore, the impacts associated with the proposed Project are considered significant (Class I).

Any portion of the EMT infrastructure, including the oil storage tanks, pump house, marine loading line, and intermediate pipes and valves, has the potential to rupture or leak. Oil spills could affect surface and groundwater, depending on the location and size of the spill. Under worst-case conditions, maximum estimated spill volumes of oil would be lost from the marine loading line directly into the southeast trending gully, which flows into the nearby dune swale pond, as no secondary containment is present along the pipeline. Although secondary containment is present surrounding the two 65,000-barrel (10,334-m^3) oil storage tanks, the worst case scenario would involve rupture of both the oil storage tanks and the adjacent soil containment berms, as a result of severe seismically induced ground shaking. The EMT overlies the potentially active South Branch More Ranch Fault and the North Branch More Ranch Fault is located approximately 0.4 mile (0.6 kilometer) north of the project site (see Section 4.1, Geological Resources). The EMT was constructed in 1929 and seismic upgrades and retrofitting have not been completed, making the facility more susceptible to earthquake induced damage. Maximum possible spill volumes at the EMT and associated marine loading line are presented in Section 4.2, Hazards and Hazardous Materials.

Depending on the location of the containment berm breach, such a spill could flow directly into Devereux Creek, Devereux Slough, and/or the adjacent southeast trending gully that flows into the dune swale pond, located approximately 1,500 feet (450 m), 1,000 feet (300 m), and 400 to 500 feet (120 to 150 m) from the EMT, respectively. Although some of the more toxic components of oil, e.g., volatile organic compounds, would be lost rapidly due to aeration, i.e., volatilization, spills reaching any of these waterways could have significant, long-term, and widespread impacts to water quality and consequently, sensitive biological resources. Similarly, subsurface, i.e., underground, spills, or surface spills, could result in significant, long-term contamination of groundwater, as the on-site soils are generally unconsolidated and permeable and groundwater occurs at relatively shallow depths.

Venoco currently maintains an Emergency Action Plan (EAP), which addresses spill response actions to be completed in the event of a “significant event.” The EAP provides an emphasis on marine spills, and an Area Contingency Plan, Site Summary and Site Strategy Sheet for the Devereux Slough area is provided as an attachment to the EAP. The Area Contingency Plan includes brief instructions on spill containment, followed by recommended resources for constructing spill dikes, e.g., one piece of heavy equipment, sand bags, and plastic sheeting, as well as logistical details, e.g., site access, staging area, and closest boat launch. Implementation of this Emergency Action Plan would reduce potentially significant impacts associated with a larger spill.

Venoco also maintains the South Ellwood Field Oil Spill Contingency Plan (OSCP). This plan addresses inspection and maintenance, training and drills, notification procedures, and provides general oil spill response and cleanup techniques for various terrains, including for creeks and rivers (Venoco 2005). The OSCP also includes several appendices containing maps and listings of potentially affected sensitive resources such as plant and wildlife habitats, creeks and drainages, beaches, sloughs, marshes, etc., in the surrounding area.

In addition, a number of yearly and as-needed inspections are required of Venoco by the Santa Barbara County Energy Division, including:

- Annual hydrotest of the pipeline, as required by the California State Lands Commission;
- Long range guided ultrasonic screening inspection from the pump house to the sand dune area, but not in the intertidal area;
- Visual inspections of the loading line by Venoco to ensure that an episodic wave scour-induced free span does not exceed 30 feet (9 m) (see Section 4.1, Geological Resources); and
- Venoco’s commitment to repair the external coating on the loading line when exposed by winter storms or as the situation warrants.

Such actions, in addition to the Mitigation Measure indicated below, would contribute in limiting the potential for spills and associated significant impacts.

Mitigation Measures

WQ-2a. Storm Water Pollution Prevention Plan. A site-specific Storm Water Pollution Prevention Plan shall be prepared and submitted to the California Regional Water Quality Control Board, Central Coast Region, before the lease extension is granted, to prevent adverse impacts to nearby waterways associated with oil spills and contaminated storm water releases not covered under the EAP, which only applies to "significant events" and is not discussed in detail by the OSCP. This plan would similarly include, but not be limited to site-specific diagrams illustrating primary surface drainage features, e.g., the southeast trending gully leading to the dune swale pond, and proposed spill containment, i.e., dike configurations, within those drainages; delineation of drainage features; and a description of Best Management Practices, including spill containment equipment and procedures that are tailored for the project site. The plan shall also describe the source water, existing uses, and water disposal protocol of the onsite pond, in the southwest portion of the EMT.

Rationale for Mitigation

MM WQ-2a would minimize potential oil spill-induced water quality impacts of a nearby dune swale pond, surrounding wetland area, Devereux Slough, and underlying groundwater resources. **MM WQ-2a** would minimize potential impacts associated with small oil spills and contaminated storm water releases by providing site-specific information and management practices regarding on-site drainage and protection of nearby water resources.

Residual Impacts

County Energy Division mandated annual inspections and (partial) pipeline testing, augmentation of Venoco's EAP and OSCP, and **MM WQ-2a**, implementation of a SWPPP, would reduce the severity of potential spill impacts to water resources. Regardless, because of the severity of impacts to surface water and groundwater resources associated with potential large oil spills from the EMT, impacts would remain significant (Class I) after mitigation.

Table 4.4-2
Summary of Hydrology, Water Resources, and Water Quality Impacts and Mitigation Measures

Impact (Impact Class)	Mitigation Measures
WQ-1: Oil spill impacts to marine water quality (Class I).	Implement **MM HM-1b** through **HM-9a**
WQ-2: Potential facilities leaks and impacts to nearby onshore waterways (Class I).	**WQ-2a.** Storm Water Pollution Prevention Plan.

4.4.5 Impacts Of Alternatives

No Project Alternative

The No Project Alternative would avoid increasing the impacts identified in the previous section. While these impacts are also associated with existing operations, the incremental increase in these impacts would be avoided.

Water quality impacts under this alternative would be reduced as compared with the proposed Project. Abandonment of the EMT would preclude the potential for adverse impacts due to large oil spills into the marine environment, underlying groundwater, a nearby dune swale pond, surrounding wetland, Devereux Creek, and Devereux Slough. Minor spills of petroleum products could occur from equipment during abandonment activities; however, potential short-term water quality impacts associated with such spills could be minimized through implementation of a SWPPP. Impacts would be potentially significant but mitigable (Class II) and implementation of MM WQ-2a would be required. These impacts, however, would be evaluated in a separate CEQA document.

Truck Transportation

Impact WQ-3: Potential Impacts to Water Quality from Oil Spills from Trucks

Water quality in creeks and drainages along the truck transportation route could be adversely impacted in the event of a crude oil spill during a tanker truck accident (Potentially Significant, Class II).

Impact Discussion

Water quality impacts under this alternative would be less than those described for the proposed Project. Impacts to the project site vicinity would be similar to those described for the No Action Alternative, as the EMT would no longer be required. However, water quality in creeks and drainages along the truck transportation route could be adversely impacted in the event of a crude oil spill during a tanker truck accident. See Section 4.2, Hazards and Hazardous Materials, regarding the potential for such a spill occurring in association with this alternative. This impact would be considered potentially significant but mitigable (Class II).

Mitigation Measures

Implement **MM WQ-2a.**

Rationale for Mitigation

Implementation of **MM WQ-2a** would minimize potential oil spill-induced water quality impacts to creeks and drainages, and underlying groundwater (see Rationale for Mitigation for Impact WQ-2).

Pipeline Transportation

Impact WQ-4: Potential Impacts to Water Quality from Oil Spills from the Pipeline

Water quality in creeks and drainages along the pipeline route could be adversely impacted in the event of a crude oil spill (Significant, Class I).

Impact Discussion

Impacts under the pipeline transportation alternative would be similar to those described for the proposed Project. The pipeline would traverse several creeks en route to Las Flores Canyon. Potential oil spills along the pipeline, such as a result of seismically induced ground failure, corrosion, erosive stream scour, or landslides (see Section 4.1, Geological Resources), would potentially impact any of these creeks or subsidiary drainages. Although an Oil Spill Response Plan would be prepared by the Applicant in association with pipeline construction, the severity of impacts associated with potential large oil spills from the pipeline would be significant and unmitigable (Class I).

Mitigation Measures

Implement **MM WQ-2a.**

Rationale for Mitigation

Implementation of **MM WQ-2a** would minimize potential oil spill-induced water quality impacts to creeks and drainages, and underlying groundwater (see Rationale for Mitigation for Impact WQ-2).

Residual Impact

Implementation of **MM WQ-2a** would reduce the severity of potential spill impacts to water resources. Regardless, because of the severity of impacts to surface water and groundwater resources, associated with potential large oil spills from the pipeline, impacts would remain significant (Class I) after mitigation.

4.4.6 Cumulative Projects Impact Analysis

Impact WQ-5: Cumulative Impacts to Marine Water Quality

Potential oil spills occurring as a result of lease renewal could result in contributions to cumulative water quality impacts on the waters of the Santa Barbara Channel (Significant, Class I).

Impact Discussion

Potential oil spills occurring as a result of lease renewal could result in contributions to cumulative water quality impacts on the waters of the Santa Barbara Channel offshore the project site. Section 4.0, Environmental Analysis, details projects in the surrounding area that could produce impacts to marine water quality similar to those anticipated by the proposed Project.

Projects which could produce an increased risk of oil spill that could impact the same coastal areas as the proposed Project include the following (please refer to Table 4-1, Relevant Cumulative Projects):

- Cabrillo Port/BHP Billiton LNG International, Inc. (Project No. 1);
- LNG Terminal at Platform Grace/Crystal Energy LLC (Project No. 2);
- Carpinteria Field Redevelopment Project/Carone Petroleum Corp. and Pacific Operators Offshore Inc. (Project No. 3);
- Paredon Project/Venoco (Project No. 4);

- Return to production of State Lease PRC-421/ Venoco (Project No. 7);
- Extended Ellwood Field Development, Venoco (Project No. 8);
- Platform Grace Mariculture/Hubbs-SeaWorld Research Institute (Project No. 9);
- Platform Grace Resumption of Oil Production (Project No. 10); and
- Development of additional 36 offshore Federal leases (Project No. 17).

The two LNG Projects (Projects No. 1 and No. 2) involve the use of large tankers and support vessels which would introduce the risk of fuel spills into the marine environment, because they have dual-fuel engines that use the boil-off LNG and oil fuel. The Carpinteria Field Redevelopment, Paredon, and PRC-421 Projects (Projects No. 3, No. 4, and No. 7) would involve increased offshore/nearshore drilling and associated crude oil transportation, which would also increase the risks of oil spills. Specifically, production from lease PRC-421 (Project No. 7) would increase the amount of oil being transported by Line 96, and subsequently the EMT. This would marginally increase the size of potential oil spills from the facilities involved. In addition, as the existing pipeline would be used between the PRC-421 and Line 96, and additional oil shipped to the EMT, this would increase the potential frequency of spills to the marine environment, resulting in increased marine water quality impacts. The Carpinteria Field Redevelopment (Project No. 3) would also result in water quality impacts from the discharge of produced water into the marine environment.

The Ellwood Field Development Project (Project No. 8) would involve increased spill risks due to offshore drilling. However, as the EMT would be abandoned as part of this Project, cumulative spill risks would most likely be reduced as part of this Project. The extended field develop would involve abandoning the operations of the EMT and transporting oil by pipeline only. This would reduce the risks of a marine oil spill and associated water quality impacts as Line 96 and the EMT would no longer be used.

The Platform Grace Projects (Projects No. 9 and 10) would include a resumption of oil production and an increase in vessel traffic with attendant risks of spills. Although the status of the 36 undeveloped Federal leases (Project No. 17) remains in litigation (see discussion in Section 4.0, Environmental Analysis), development of these leases would result in additional exploratory drilling, increases in vessel traffic and potential oil spills to the marine environment that would have a cumulative effect alongside the proposed Project. The development of the Bonita, Rocky Point, Gato Canyon, Sword, and

Cavern Point leases, in particular, would be most likely to overlap with proposed Project. All of these Projects would exacerbate an already significant impact (Class I) associated with the proposed Project's risks of spills to the marine environment.

Mitigation Measures

Each of these Projects must meet regulatory requirements designed to reduce the probability and consequences of accidental releases to the environment. However, even the best designed and implemented mitigation measures, such as safe design of the facilities, oil spill contingency plans, training and drills, and availability of oil spill cleanup means, cannot eliminate all risk of an oil spill.

Rationale for Mitigation

Implementing regulatory requirements with industry best management practices can lower the risk and consequences of an accidental oil spill.

Residual Impact

The proposed Project's contribution to cumulative projects would remain significant (Class I).

Impact WQ-6: Cumulative impacts to Devereux Slough

Potential oil spills occurring as a result of the Project could result in significant cumulative water quality impacts to Devereux Slough (Significant, Class I).

Impact Discussion

Potential oil spills occurring as a result of lease renewal could result in contributions to cumulative water quality impacts on Devereux Slough. Storm water quality testing during 1999/2000 included as part of the Santa Barbara County Water Agency's Project Clean Water indicates that the Devereux Slough is polluted by runoff containing bacteria and nutrients that exceed acceptable levels and are capable of accelerating aquatic plant and algae growth, including elevated levels of fecal and total coliform, enterococcus, pesticides, and heavy metals such as copper, lead, and zinc. In addition, streams entering Devereux Slough carry a high sediment load. Numerous other approved and probable future projects within the Devereux Slough watershed (see Table 4-1 in Section 4.0, Environmental Analysis), e.g., Projects No. 22, Price Gas Station/Mini Mart, Nos. 31 and 32, Ocean Meadows Residences and Golf Course Improvements, No. 20, Sandpiper Golf Course Remodel, Nos. 25 and 26, UCSB

Housing, and No. 34, Devereux School Master Plan, would contribute runoff and pollutants. The pollutant load contribution of these projects could result in cumulatively significant but feasibly mitigated (Class II) impacts on water quality. However, because of the severity of impacts associated with potential large oil spills from the EMT, the Project's contribution to the cumulative degradation of Devereux Slough would be significant (Class I), even with implementation of mitigation measures.

The Santa Barbara County Water Agency is currently developing recommended changes to County land use policies, design standards, and related land ordinances related to stormwater quality in unincorporated urban areas of Santa Barbara County. These changes are necessary as a result of the EPA's NPDES Phase II stormwater quality regulations and are being completed in an effort to provide systematic, consistent, and complete review of existing land use ordinances, general plan elements (including the Local Coastal Plan), and development standards for new projects and redevelopment. These changes would result in CEQA thresholds and analysis procedures in relation to stormwater quality, thus allowing for more definitive impact analyses than is currently possible. In addition, in accordance with CEQA, cumulative impact analyses would be completed for all cumulative projects in the watershed, before and subsequent to development of such ordinances and thresholds. Appropriate mitigation measures would be applied to each cumulative project in an effort to reduce potentially significant water quality impacts to less than significant.

Mitigation Measure

As discussed above, various initiatives are underway to minimize cumulative impacts to water quality. However, these have not yet been finalized and implemented; therefore, no additional mitigation measures have been identified.

Rationale for Mitigation

No mitigation measures have been identified that would reduce the level of this impact to below the level of its significance criteria.

Residual Impact

Due to the severity of impacts associated with potential large oil spills from the EMT, the Project's contribution to the cumulative degradation of Devereux Slough would be significant (Class I).